


PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WPP91350		FOR FURTHER ACTION		See Form PCT/PEA416
International application No. PCT/US2004/018285		International filing date (day/month/year) 09.06.2004	Priority date (day/month/year) 09.06.2003	
International Patent Classification (IPC) or national classification and IPC C08C19/44, C08L19/00				
Applicant BRIDGESTONE CORPORATION				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 06.01.2005		Date of completion of this report 10.08.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Denis, C Telephone No. +31 70 340-		



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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-15 as originally filed

Claims, Numbers

1-10 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1,6,7
	No: Claims	2-5,8-10
Inventive step (IS)	Yes: Claims	9,10
	No: Claims	1-10
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V.

The following documents are referred in this communication; the numbering will be adhered to in the rest of the procedure:

D1: WO-A-01/34658

D2: EP-A-0 801 078

Novelty (Article 33(2) PCT):

The present application does not meet the criteria of Article 33(1) PCT because the subject-matter of claims 2 to 5 and 8 to 10 is not novel in the sense of Article 33(2) PCT.

Document D1 discloses a method for preparing a functionalised polymer involving the reaction of a pseudo-living polymer (based on conjugated diene monomers such as 1,3-butadiene) with a functionalising agent of formula (I) (see page 4 lines 20 to 30). The functionalising agent contains an isocyanate or isothiocyanate group and can be 3-isocyanatopropyltrimethoxysilane (page 14 lines 3 to 23). Document D1 discloses also a vulcanisate comprising the above functionalised polymer and fillers (page 19 line 26 to page 20 line 15). The present application differs from document D1 in that the polymer is obtained by an anionic polymerisation process. However this technical feature cannot be considered as a distinguishing technical feature over D1 for a **product claim**.

Document D1 is prejudicial to novelty of the subject-matter of claims 2 to 5 and 8 to 10 (**product claims**) for the following reasons:

Claims 2 (and claim 3) of the present application discloses a functionalised polymer that is defined in terms of the process by which the product is made (i.e. anionic polymerisation). Such claims (and depending claims 4, 5 and 8 to 10) should be construed as a claim to the product (i.e. functionalised polymer) *per se* that possesses the characteristics derived from the manufacturing process stated in the claim (see Guidelines A5.26[1] PCT). Therefore, the patentability of a product defined by a product by process claim does not depends on its method of production. There are no special technical features of the resulting modified polymer in claim 2 (or claim 3) that could distinguish the functionalised polymer of claim 2 (or claim 3) from other terminally functionalised polymers (such as microstructure, viscosity, ...). The vulcanisate of claim 2 and the functionalised polymer of claim 3 will therefore be regarded as comprising a

polymer terminally functionalised by an isocyanato alkoxysilane or isothiocyanato alkoxysilane group. Document D1 contains all these technical features (in terms of the product *per se*).

However, claims 6 and 7 are relating to process features only, and these features are not disclosed in document D1.

The subject-matter of claims 2 to 5 and 8 to 10 is therefore not novel in view of D1.

Inventive step (Article 33(3) PCT):

The subject-matter of claims 1, 6 and 7 does not involve an inventive step for the following reasons:

Document D1, which is considered as the closest prior art over claims 1, 6 and 7 discloses a method for preparing a functionalised polymer by polymerising 1,3-butadiene (and other monomers) in presence of a neodymium based catalyst. The pseudo-living polymer formed is then reacted with a functionalising agent of formula (I). Examples of such compounds are 3-glycidoxypropyltrimethoxysilane and **3-isocyanatopropyltrimethoxysilane** (page 14 lines 3 to 23).

Claims 1, 6 and 7 of the present application differs from document D1 in that the polymer is obtained by an *anionic polymerisation* process.

There are no demonstrated effects on file with regard to this special technical feature. All the polymers on file are polymerised with butyl lithium as initiator of anionic polymerisation.

The objective of claims 1, 6 and 7 of the present application can therefore be regarded as to provide an alternative **process** for preparing terminally modified polymers.

In document D2 the process for preparing functionalised polymers involves the following steps: preparing a living polymer by *anionically polymerising* 1,3-butadiene and styrene (with butyl lithium) and reacting the living polymer with functionalising agent such as 3-glycidoxypropyltrimethoxysilane.

Knowing D1, the skilled man would have a incentive in D2 to prepare a living polymer (with butyl lithium) and react this living polymer with any functional group of D1, and more particularly with an isocyanate-containing agent such as an isocyanatopropyltrimethoxysilane. Knowing from D2 that a living polymer may react with 3-glycidoxypropyltrimethoxysilane, the skilled man would have the incentive to make

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use of the teaching of D2 and react a living polymer with one of the functional group of D1 i.e. isocyanatopropyltrimethoxysilane.

Claims 1, 6 and 7 are therefore not inventive.

Remark concerning the clarity of claims 4 to 9 :

Claims 4 to 9 are not clear because they refer to a method **and** a product i.e. refer to two different types of claims. This leads to unclarity of claims especially for claims 6 and 7 where all the technical features disclosed in the claims are strictly related to the process for preparing the living polymer : type of initiator and ratio between terminating agent and initiator. The Applicant should specify clearly which claims (and which technical features) relate to a process or a product claim.